



## Lake Michigan Fact Sheet

# CONTROLLING LAKE MICHIGAN LaMP POLLUTANTS

This fact sheet lists the pollutants by Lake Michigan Lakewide Management Plan (LaMP) category and highlights how these pollutants are addressed by U.S. Environmental Protection Agency (EPA) programs--both regulatory and voluntary. Other federal and state agencies have additional authorities that may, in some way, control these pollutants. Every environmental statute highlighted controls almost all LaMP pollutants in some way, and some of the LaMP pollutants have been banned from intentional production. Bans, however, do not always require destruction of products in use. Reviewing the effectiveness of existing controls is one step in the process of identifying the need for further actions such as prevention, reduction, source removal, or control activities. The LaMP process continues to evaluate the role of other sources, such as air deposition and sediments.

### What are the Lake Michigan Proposed LaMP Pollutants?

The September 30, 1993, draft LaMP describes three categories for Lake Michigan LaMP pollutants: critical pollutants, pollutants of concern, and emerging pollutants.

Proposed LaMP Critical Pollutants
polychlorinated biphenyls (PCBs)
dieldrin
chlordane
dichlorodiphenyltrichloroethane (DDT) and metabolites
mercury
dioxins
furans

Proposed LaMP Pollutants of Concern
arsenic
cadmium
chromium
copper
cyanide
lead
zinc
hexachlorobenzene
toxaphene
polycyclic aromatic hydrocarbons (PAHs)

Proposed LaMP Emerging Pollutants
atrazine
selenium
PCB substitute compounds

## **EPA Regulatory Programs and the Proposed LaMP Pollutants**

### **Clean Water Act**

The goal of the Federal Water Pollution Control Act, as amended (or the Clean Water Act, CWA) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

### ***Wastewater and Storm Water Permits***

Through the CWA, priority pollutants were identified by Congress and interpreted by EPA to include 126 chemicals. EPA evaluated the technologies available to remove these pollutants from wastewater and selected the best technologies for a number of industries. EPA then prepared national standards for those pollutants as a mass or concentration remaining in wastewater after the best available waste-water treatment. All point source discharges are required to obtain a National Pollution Discharge Elimination System (NPDES) permit to lawfully discharge. NPDES permits require the operator of the source to employ the best available water pollution control technology and to further reduce discharges of pollution, as necessary, to comply with water-quality standards.

### ***Water Quality Standards and Criteria***

The same list of 126 chemicals must be considered in preparing water-quality standards and criteria under the CWA. Water-quality standards consist of the designated uses of the navigable waters (such as use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes including their use and for navigation) and water-quality criteria based on such uses, and a non-degradation policy intended to maintain high-quality waters in their present condition. Toxic substances shall not be present in waters of the State in toxic amounts. Water-quality criteria for the 126 priority pollutants are typically expressed numerically. In addition to being considered in the development of NPDES permits for point source discharges, water-quality standards and criteria may be considered in efforts to control nonpoint sources of pollution. Money made available under the CWA helps States control nonpoint sources of pollution.

### ***Final Water-Quality Guidance for the Great Lakes System***

The Final Water Quality Guidance for the Great Lakes System, also known as the Great Lakes Initiative or GLI, consists of numeric water-quality criteria to protect aquatic life, wildlife, and human health from 29 pollutants (including all proposed critical pollutants except furans, and all proposed pollutants of concern except lead); detailed methodologies to develop additional criteria or maximum values comparable to criteria for other pollutants; a non-degradation policy; procedures to determine the need for and to calculate water quality-based effluent limits for point source discharges; and procedures for determining the total maximum daily load of pollutants which may enter the Lakes or their tributaries from all sources while still attaining water-quality standards.

### **Comprehensive Environmental Response, Compensation, and Liability Act**

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA or Superfund) is probably best known for authorities to respond to emergency releases of hazardous materials, and to clean up high-profile sites on the National Priorities List. While Superfund focuses on site-specific cleanups, it also addresses off-site contamination of surface waters, sediments, and ground water.

Superfund has several provisions that are preventative in nature. These provisions address two different subsets of the LaMP pollutants. First is the requirement to report, to the National Response Center, spills greater than a "reportable quantity" (RQ) of "hazardous substances" which include all the proposed critical pollutants except furans (with an RQ of 1 pound each), all of the proposed pollutants of concern, and selenium (with various RQs, depending on the chemical form of the release) Reporting requirements assure that the State and Federal officials are notified of the spill, and emergency responders, including responsible parties, address the spill to avoid or mitigate adverse impacts to human health or the environment. Second, the Toxics Release Inventory (TRI) program under the Emergency Planning and Community Right to Know Act (incorporated as a Superfund amendment) applies to manufacturing facilities (standard industrial classification codes 20-39) that employ 10 or more full-

time employees and that manufacture or process more than 25,000 pounds or use more than 10,000 pounds of any listed chemical during the calendar year. A total of 24,600 facilities nationwide are required to make public the levels of toxic chemicals they release into the air, water, and land. Facilities report their TRI information annually to EPA and to the state in which they are located. The list of chemicals required to be reported includes some proposed critical pollutants (PCBs, chlordane, and mercury), all the proposed pollutants of concern, and none of the emerging pollutants.

### **Oil Pollution Act**

The Oil Pollution Act address threats to the environment from petroleum (i.e. PAHs) and non-petroleum based oil releases or spills. In addition to requiring that spill prevention measures (Spill Prevention Control and Countermeasure Plans) be taken by production, storage, and transportation facilities, the Act requires EPA to prepare for (area-wide contingency plans and Facility Response Plans) and to respond to any oil spill affecting the inland waters of the United States, including the Great Lakes system.

### **Clean Air Act**

The purpose of the Clean Air Act, as amended (CAA) is to protect and enhance the quality of the nation's air resources to promote the public health and welfare and the productive capacity of its population. A primary goal of the CAA is to encourage and promote reasonable actions for pollution prevention at all levels of government. It provides authority to regulate 14 of the 20 LaMP pollutants.

Section 112(b) of the 1990 CAA amendments contains a list of 188 hazardous air pollutants (HAPs). EPA is required by Section 112(c) to publish a list of categories and subcategories of major sources (potential aggregate emitters of 10 tons per year of any HAP or 25 tons per year or more of any combination of HAPs) and area sources (stationary sources of HAPs, excluding vehicles and major sources) of these pollutants. In addition, Section 112(c)(6) requires EPA to identify and regulate the sources responsible for at least 90 percent of the total air emissions of alkylated lead compounds, polycyclic organic matter, hexa-chlorobenzene, mercury, PCBs, 2,3,7,8-tetrachlorodibenzofurans, and 2,3,7,8-

tetrachlorodibenzo-p-dioxin.

Section 112(d) of the CAA directs EPA to establish a maximum achievable control technology (MACT) standard for each of the source categories determined under Section 112(c). Each MACT standard creates emission limits for the HAPs emitted by sources within the category. These hazardous air pollutants listed in Section 112(b) of the CAA overlap with the LaMP proposed pollutants: chlordane, DDE (a DDT metabolite), hexachlorobenzene, PCBs, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD, a dioxin), toxaphene, arsenic compounds, cadmium compounds, chromium compounds, cyanide compounds, lead compounds, mercury compounds, polycyclic organic matter, and selenium compounds.

In Section 112(m), the CAA provides EPA the authority to regulate air emissions of hazardous air pollutants if air deposition is found to contribute to exceedences of water-quality standards.

### **Resource Conservation and Recovery Act**

The objectives of the Resource Conservation and Recovery Act (RCRA) are to promote the protection of human health and the environment and to conserve valuable material and energy resources by proper management of solid and hazardous waste. The statute does not limit solid wastes to a particular phase state and does not include a list of chemicals. Rather, solid waste is defined to include garbage, refuse and sludge resulting from particular activities. Hazardous waste is solid waste which may pose a substantial present or potential hazard to human health or the environment when improperly managed. RCRA encourages process substitution, materials recovery, properly conducted recycling and reuse, and treatment over disposal of wastes.

Under Subtitle C of RCRA, regulatory definitions of solid and hazardous waste have been determined. Hazardous wastes have characteristics such as ignitability, corrosivity, reactivity, and toxicity. It is important to realize that a single waste stream may contain multiple pollutants and that a single pollutant may be regulated under many RCRA hazardous waste codes. For example, lead is identified as a hazardous constituent in more than 20 RCRA hazardous wastes. All of the proposed critical pollutants and pollutants of concern are included in at least one RCRA

hazardous waste, and, of the proposed emerging pollutants, several selenium compounds are also identified as hazardous wastes.

## **EPA Regulatory Programs and the Proposed LaMP Pollutants**

Hazardous wastes are subject to varying levels of federal regulation, depending in part upon the volume of waste generated. A particular LaMP pollutant may be present in a waste, but if hazardous waste is created at a low rate at that facility (e.g., less than 100 kg per calendar month), the waste does not enter RCRA's cradle-to-grave regulatory scheme. Household hazardous wastes are also excluded from the regulatory definition of hazardous waste. The cradle-to-grave regulatory scheme means that wastes are tracked during active management by manifesting of shipments from the generator through subsequent handlers to the waste's final recycling (e.g., burning for energy recovery or solvent distillation) or disposal (e.g., combustion, treatment to render nonhazardous, or placement in a landfill).

Under Subtitle D of RCRA, federal solid waste regulations include criteria for classification of solid waste disposal facilities and practices, such as "application to land used for the production of food-chain crops." This regulation provides the criteria distinguishing between open dumps and allowable application of solid waste containing cadmium (in units of kilogram per hectare, depending on soil properties) or PCBs (concentrations greater than 10 mg/kg must be incorporated into the soil, unless it is assured that PCB content is less than 0.2 mg/kg in animal feed or less than 1.5 mg/kg--fat basis--in milk). Cadmium and PCBs are the only two pollutants so specifically addressed.

Under the authority of RCRA Subtitle I regulations, EPA regulates underground storage tanks (USTs) containing hazardous substances as defined in CERCLA (not including RCRA Subtitle C hazardous wastes) and petroleum products. The technical standards include provisions for design, installation, operating, release response, and closure. As discussed under CERCLA reporting requirements for releases of hazardous substances, 17 of the 20 LaMP pollutants are covered by UST regulations.

## **Toxic Substances Control Act**

The Toxic Substances Control Act (TSCA) gives EPA the authority to gather information about the toxicity of particular chemicals and the extent to which people and the environment are exposed to them. EPA then uses the information to assess whether the chemicals cause unreasonable risks to humans and the environment and to institute appropriate control actions after weighing potential risks against benefits to the nation's economic and social well-being. Essentially all chemical substances except those used for the following eight purposes are subject to TSCA regulatory authority: pesticides, tobacco, nuclear material, fire-arms and ammunition, food, food additives, drugs and cosmetics. These uses are regulated under other statutes.

Using PCBs as an example, the manufacture of PCBs was banned under TSCA authority in 1978, but due to specific authorizations, exclusions, or exemptions, some PCBs can be used to the end of their useful lives. TSCA also prohibits dilution of PCBs to avoid TSCA provisions, regulates the disposal above 50 ppm, and controls the burning for energy recovery of PCB waste oils between 2 and 50 ppm.. PCBs may still be used indefinitely in electrical equipment, such as transformers and capacitors. Because the manufacture of PCBs was banned in the 1970s, PCB transformers and capacitors are at least 20 years old. This particular group of equipment may experience a higher failure rate as it approaches the end of its useful life.

Of the other LaMP pollutants, TSCA regulates specific uses of DDT and lead and has specific testing and reporting requirements for dioxins and furans. Many PAHs have uses which may be regulated under TSCA, but the TSCA regulatory status of each would have to be checked individually.

## **Federal Insecticide, Fungicide, and Rodenticide Act**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulates substances created for the purpose of pest control. The statute requires EPA to balance risk and benefit through regulation. Of the critical pollutants, dieldrin, chlordane, and DDT are canceled pesticides. Cancellation imposes a date when sale and distribution



may no longer take place (usually, 18 months from the effective date of cancellation). End users are permitted to apply any existing stocks according to label instructions. Although DDT is a canceled pesticide, it is present as a by-product in dicofol, a related pesticide currently in use. However, all dicofol products containing more than .1 percent DDT contamination have been canceled. Fungicide compounds containing mercury have also been canceled under FIFRA. Dioxins and furans are not intentionally produced, but are created during the manufacture of some pesticides. The herbicides 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) and silvex were suspended and canceled because of dioxin contamination. Suspension is an action which disallows the use of existing stocks and uses an allowable disposal method, such as incineration or transfer to an appropriate landfill.

Of the pollutants of concern, arsenic, though considerably restricted, is still a component of some pesticides. The inorganic arsenicals, lead, calcium, and sodium arsenate and sodium arsenite have been canceled, while arsenic trioxide is mainly used for wood treatment, such as pressure-treated lumber. The organic arsenicals, disodium methane-arsenate, mono sodium methanearsenate, and cacodylic acid are used as herbicides in and around ornamental trees, shrubs, and lawns. Copper and zinc are used in pesticide products. Hexachlorobenzene was canceled under FIFRA, but is still contained as a low-level contaminant in a few pesticides currently in use, such as DCPA (dacthal) and chlorothalonil. Toxaphene's use as a pesticide is canceled.

FIFRA authority is also being used to prepare the pesticide component of ground-water protection plans. The State Management Plan (SMP) proposed rule includes voluntary best management practices to reduce the contamination of ground water by pesticides. In the proposed rule, the five pesticides, atrazine, simazine, cyanazine, alachlor, and metolachlor will require that SMPs be developed for each state. These five pesticides are herbicides used on major crops (particularly corn and soybeans) in the Lake Michigan watershed. Only atrazine has been identified as a LaMP pollutant because trace amounts were detected in Lake Michigan water in 1992. As part of the SMP process, the use of a given pesticide can be restricted in specific portions of a state when the

ground-water concentration of the pesticide exceeds a state's regulatory threshold and the contamination is not from a point source.

## **EPA Voluntary Programs and Proposed LaMP Pollutants**

### **Great Lakes Binational Toxics Strategy**

Pollution prevention activities can be targeted on LaMP pollutants by applying the same four-step process laid out in the *Canada--United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes* (information gathering, analysis, identification of cost-effective options, and implementation) to all of the LaMP pollutants. The Strategy includes challenges to the United States and Canada to virtually eliminate mercury, dioxins and furans, chlordane, aldrin/dieldrin, DDT, mirex, toxaphene, octachlorostyrene, alkyl lead, PCBs, hexachlorobenzene, and benzo(a)pyrene--a significant overlap with the draft Lake Michigan LaMP pollutants. Information gathering and analysis can consist of reviewing government databases (e.g., TRI, RCRA biennial reports, pesticide use and field crop data) to identify the most significant sources of the pollutants and their sources.

### **33/50 Program**

A partnership approach may be appropriate when regulatory approaches are not cost effective or are politically impossible. In *Partnerships in Preventing Pollution, A Catalog of the Agency's Partnership Programs* (United States Environmental Protection Agency, EPA 100-B-96-001, Spring 1996), EPA explains how it is building partnerships with a variety of groups, including small and large businesses, citizen groups, state and local governments, universities and trade associations. A successful example of pollution prevention is the 33/50 program, which set national priorities for preventing chemical releases to the environment by targeting 17 pollutants reported to TRI in 1988 for reduction by 33 percent in 1992 and 50 percent in 1995. The 33/50 target chemicals were selected nationally on the basis of relative toxicity, volumes of use, and potential for reduction through

pollution prevention. The LaMP pollutants overlap with these 33/50 chemicals: mercury and compounds, cadmium and compounds, chromium and compounds, cyanide compounds, and lead and compounds. The 1,300 individual voluntary pledges from corporate America represent a commitment to a cleaner environment in a healthy economy.

### **Pesticide Environmental Stewardship Program**

EPA also describes the Pesticide Environmental Stewardship Program (PESP) in the publication, “*Partnerships in Preventing Pollution, A Catalog of the Agency’s Partnership Programs.*” The PESP is a broad effort by EPA, the United States Department of Agriculture, and the Food and Drug Administration to reduce pesticide use and risk in agriculture and non-agricultural settings. In September 1993, the three agencies announced a federal commitment to two major goals:

Developing specific use/risk reduction strategies that include reliance on biological pesticides and other approaches to pest control that are thought to be safer than traditional chemical methods.

Having 75 percent of U.S. agricultural acreage adopt integrated pest management programs by the year 2000.

One of the ways to reduce the use of persistent toxicants for pest control is to use genetically engineered crops, such as *Bacillus Thuringiensis* (BT) corn, potatoes and cotton. Genetic engineering is also used to prepare herbicide-resistant crops, such as Round-up Ready Soybeans. While not necessarily reducing overall pesticide use, glyphosate (the active ingredient of Round-up) has not become a widespread water contaminant.

### **Common Sense Initiative**

Through this initiative, EPA is moving beyond the traditional single media, one-size-fits-all approach to environmental and public health protection towards a holistic, industry-by-industry approach that looks across all media. Approximately 40 projects are underway in six industry

sector teams made up of representatives from:

- Environmental Organizations
- Environmental Justice and Community organizations
- Industry
- Labor
- Federal, State, and Local governments.

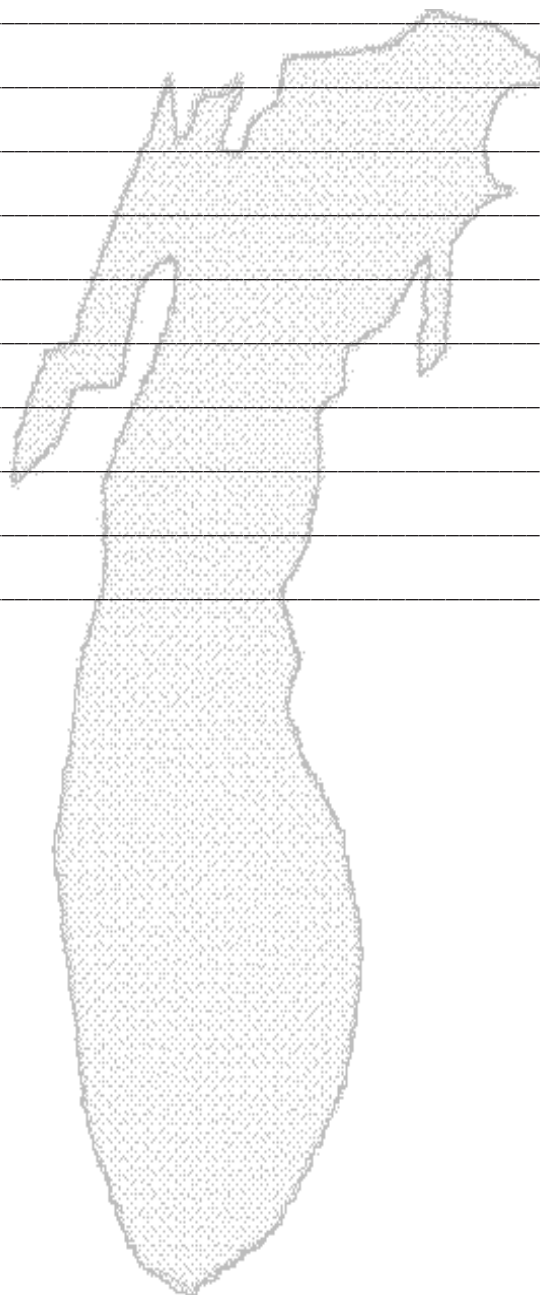
These teams are developing holistic, consensus-based strategies to public health and environmental protection that are flexible, innovative alternatives to the current regulatory system. The six industries participating are:

Automobile Manufacturing  
Computers and Electronics  
Iron and Steel  
Metal Finishing  
Petroleum Refining  
Printing

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*SPACE FOR NOTES:*



*For more information, please contact Sue Brauer, (312) 353-6134, E-mail: [brauer.sue@epamail.epa.gov](mailto:brauer.sue@epamail.epa.gov)  
U.S. EPA, 77 West Jackson Blvd., Chicago, Illinois 60604*